

ABSTRACT

The invention provides debris collection devices that include a debris contacting mechanism, a debris transport mechanism that is configured to receive debris moved by the debris contacting mechanism at an inlet and move such debris towards a debris storage compartment, and a filter and vacuum assembly. The filter and vacuum assembly includes an inlet disposed downstream of the inlet of the transport mechanism and upstream of the debris storage compartment, relative to the path of transported debris. In operation, the filter and vacuum assembly generate a primary air flow that draws the airborne particles into the inlet of the transport mechanism, along a path proximate to the transport mechanism, into the inlet of the filter and vacuum assembly and through a filter located within the filter and vacuum assembly without generating a substantial airflow through the storage compartment. Related debris collection and processing systems and methods also are provided.

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